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Iowa Needs Red Clover

RED CLOVER, the old standby rotation legume of our fathers and grandfathers, was shoved back a few years ago by newer and seemingly more promising legumes.

But we think red clover still has an important place in our crop system on many Iowa farms. It will grow and produce a good crop on much land that is too acid for alfalfa and sweet clover, the two newer legumes which have probably done most of the pushing of red clover into the background.

Some of the characteristics which give red clover its position of outstanding value as a legume to be included regularly in rotation with grain crops are:

- (1) It's adapted to a wide range of soil conditions.
- (2) It yields high either for hay or pasture.
- (3) It's adapted for hay or pasture either alone or mixed with grasses and other clovers.
- (4) It will yield two crops and a good aftermath.
- (5) It has high value as a soil improving crop in the rotation — at the

By H. D. HUGHES and C. P. WILSIE

same time permitting the harvest of one or two crops for hay, or hay and seed.

Alfalfa is a wonderful crop and the acreage has increased in Iowa from a few thousand to well over a million acres. Sweet clover, once regarded as a weed, is now recognized as having great value as a soil improving crop and as a legume giving large acre returns for pasture, especially when used in mixtures with other clovers and grasses.

But neither alfalfa nor sweet clover can tolerate acid soil conditions. So many of our Iowa soils must be limed to grow these crops successfully. This constitutes one of the most important barriers to their more general use.

Red clover, however, is not a "fool-proof" crop. In the past much unadapted foreign seed was imported and gave poor results. With the loss of or-

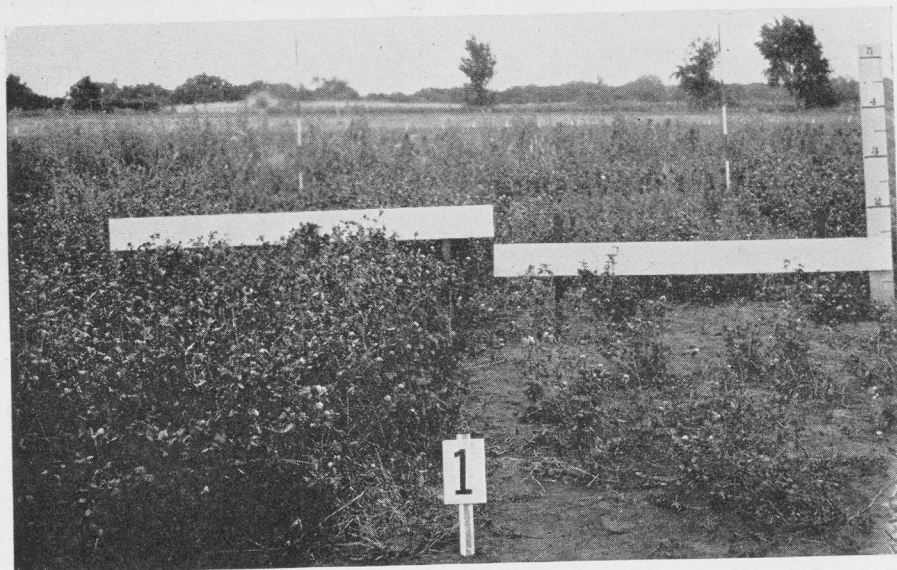
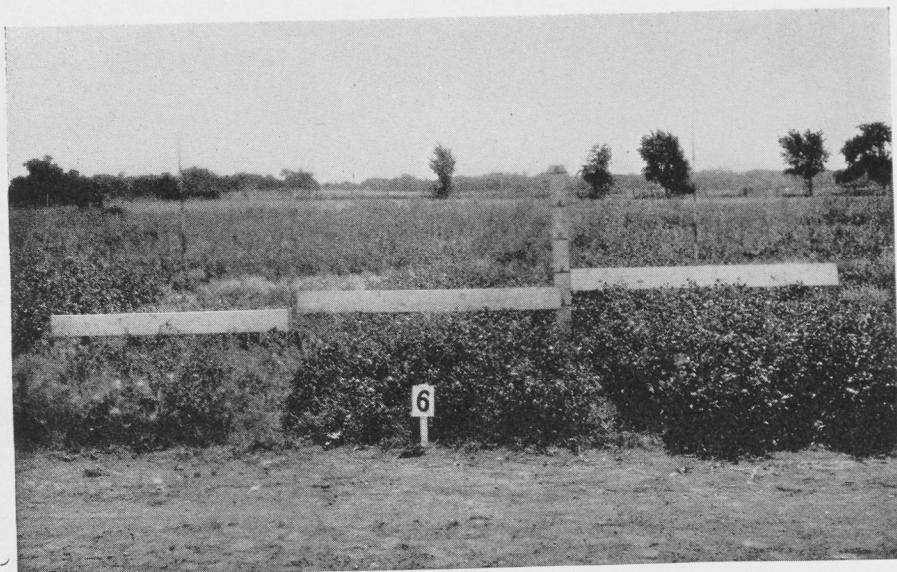
ganic matter from our soils, they dry out more quickly than formerly, and some clover stands have been lost because of the surface soil drying out.

Although red clover has a greater tolerance for acid soils than alfalfa or sweet clover, the best results are obtained when the soil is well supplied with calcium and available phosphorus. Finally, the time of cutting and method of curing the hay crop largely determine the total production of high quality feed.

Use Suitable Soil

Failures to get and maintain good stands of red clover are due mainly to unfavorable soil conditions. On farms that have been under cultivation for many years, deficiencies in lime, phosphorus and organic matter may greatly limit clover production. Fortunately, red clover has a wider range of soil adaptation than alfalfa or sweet clover and will produce good crops on soils

It's Not Too Fussy About a Soil That's a Bit Acid; It Makes Good Hay or Pasture



Top: Italian, French and Iowa red clovers (left to right) in the fields at the Iowa Station, Ames. Hundreds of different lots from these and other sources were compared through a period of years. The growth is typical of the clovers grown from these different sources of seed in our tests at Ames.

Lower: An Iowa strain of red clover (left) grown in comparison with an imported commercial lot of unknown origin (right). It has been shown that red clover from Europe is likely to be non winter hardy. Because of these and similar tests, all imported seed from Europe is now stained 10 percent red upon entry.

too acid for either of these legumes. On soils that are distinctly acid, however, we strongly recommend an application of ground limestone. There is a big advantage in applying lime several months in advance of seeding.

Lack of sufficient available phosphorus is likely to be one of the most serious limiting factors in clover growing. Superphosphate — usually applied at rates of 150 to 250 pounds per acre — may mean the difference between success and failure. Superphosphate is applied just before seeding and is worked into the soil during seedbed preparation.

When rainfall is deficient, seedings of alfalfa or sweet clover usually are more certain of establishment than red clover. This is because the alfalfa and sweet clover seedlings have more vigorous early growth and deeper rooting. The surface soil is more likely to dry out to the depth of the red clover seedling roots.

Most of our red clover and other clovers, as well as alfalfa, are seeded in the spring with a small grain nurse crop. The high organic matter content in the surface soil has largely disappeared through the years that Iowa land

has been under the plow. The result is that our soils have lost their water-holding capacity and dry out relatively quickly, as compared with previous years. Consequently, the proportion of our clover and grass seedings that fail to make a stand has increased.

Establishing Stands

What can we do to eliminate some of these failures in stands? We must counteract the effect of this lower organic matter content, and to do this we recommend the following practices as especially important.

(1) Use a short-strawed nurse crop. The early varieties of oats and barley are equally good; flax is exceptionally good.

(2) Cut down the rate of small grain seeded to half the amount usually sown. This will not greatly reduce the yield of grain and will benefit the clover, especially if growing conditions become critical.

(3) Use the small grain for pasture. This is one of the best practices in establishing clover seedings. Cutting the small grain for hay when in the milk stage has often saved seedings that otherwise would have been lost. Clipping earlier in the season and leaving the grain as a mulch also favors new seedings.

(4) Firm the seedbed with a corrugated roller or cultipacker before seeding if this is possible and if the soil is at all dry. Then broadcast the seed and use the cultipacker again. This method of seeding seems to be particularly superior to others. The seed are placed in the soil at the best depth and the rolling firms the soil particles about the seed. If dry weather immediately follows seeding, the use of the cultipacker may mean the difference between success and failure.

(5) Plant early. Get the small grain and clover seeded as soon as the season will permit.

(6) Inoculate the seed before planting if red clover has not been grown with good success on this land in recent years. The cost is low, and if the red clover bacteria are not present the crop cannot succeed.

(7) Clip the stubble of the small grain nurse crop during the last 2 weeks of August. This practice has been found helpful in bringing new seedings through the winter.

Use Adapted Strain

In past years as much as 12 million pounds of European red clover seed has been imported into the United States. In certain years large quantities of seed also have come in from the Argentine. This seed went into commercial channels and was lost sight of. The source of red clover seed or its adaptation was not questioned.

When the United States Department of Agriculture, in cooperation with the different Corn Belt Experiment Stations, initiated field tests with red clover seed from different sources, it was found that the great bulk of this seed was coming from southern Europe and that it was not winter hardy.

But regardless of the source of seed, the European type of clover was found to be unsuited to production in the United States. It gave lower yields of hay, almost never gave a seed crop, and was subject to serious winterkilling. The European type of red clover is subject to damage by the leafhopper, as in contrast with our American red clover which is protected from the attacks of this insect by a hairy covering on the stems and leaves. This is believed largely responsible for the unsatisfactory results from the imported seed.

Federal legislation now requires the

staining of all imported red clover seed 10 percent red, except that from Canada which is stained 1 percent violet.

Many trials have been made throughout the Corn Belt with regional strains of red clover from the different states. In general, these tests have shown that seed from the Corn Belt states or from the red clover seed producing areas in Idaho and Colorado may be expected to give entirely satisfactory results. Local strains from Oregon, tracing to red clover grown in that area for many years, are not recommended because of lack of winter hardiness.

In the last few years two new varieties have appeared on the market, Midland and Cumberland. Midland was developed by combining several superior Corn Belt strains into a composite variety. Foundation seed stocks are

Right: Use an early, short-strawed variety of small grain with which to seed clover and reduce the rate of seeding to about half normal. If conditions of season are critical, cut the small grain when in the milk stage and remove the crop to be used as hay.

Below: Red clover should be cut the first time when not past full bloom. This results in a higher quality hay and increases the chances of getting a seed crop with the second cutting.

maintained in the several Corn Belt states, while commercial certified seed is produced largely in Idaho, Colorado and Washington. Midland red clover is well adapted to Iowa for general use. It has proved to be winter hardy over a wide range of conditions in the north central states and is somewhat resistant to the clover disease known as northern



anthracnose.

Cumberland red clover, a composite of superior southern strains, while highly productive and quite desirable for states farther south, seems to be somewhat susceptible to winter injury in Iowa.

Red clover from Canada is likely to be somewhat smaller in growth and may mature earlier than strains from the Corn Belt states.

Free of Noxious Weeds

Use care in buying red clover seed to be sure it is free from noxious weed seed. The Iowa Seed Law provides that all lots of seed offered for sale shall be labeled giving complete information as to seed qualities, including the presence of any noxious weeds. The sale of seed containing certain primary noxious weeds is prohibited. The buyer should insist that all seed he purchases be labeled according to the provisions of the state seed law.

Cut First Crop Early

In the southern half of Iowa a relatively large acreage of red clover is grown alone. The first cutting on much of this acreage is taken for hay and the second cutting for seed. Or the first cutting may be taken for hay and the second cutting also harvested for hay or used for pasture.

A large acreage in southern Iowa also is grown in a mixture with timothy. In eastern Iowa and northeastern Iowa most of the red clover is grown in mixtures with timothy, with alsike also included in many cases.

The chief advantage in growing clover for hay, as compared with one of the grasses, is its high protein content. The maximum production of protein on an acre basis is obtained by cutting the clover when not later than in full bloom.

This is earlier than most red clover is cut. In many fields considerable portions of the clover heads are allowed

to become brown and dry before they are harvested. This is too late for the best quality of hay, for total production and for maximum yield of protein.

There is a second advantage in early cutting of red clover — even a little before the full bloom stage — it favors the setting of a possible seed crop in the second cutting. A good seed crop often is uncertain.

Bees Help Seed Crop

The one thing the grower can do which may have a greater influence on seed setting than anything else is to harvest the first cutting early. Another thing which may help is to locate a number of colonies of honeybees in or near the red clover field. Some evidence indicates that seed yields may be increased considerably by supplying additional numbers of pollinating insects.

Red clover is adapted to a much wider range of soil than alfalfa. It is not so sensitive to acid condition as alfalfa or sweet clover, but it also does best on a soil that is neutral. Phosphorus fertilizer often helps in obtaining a large yield.

